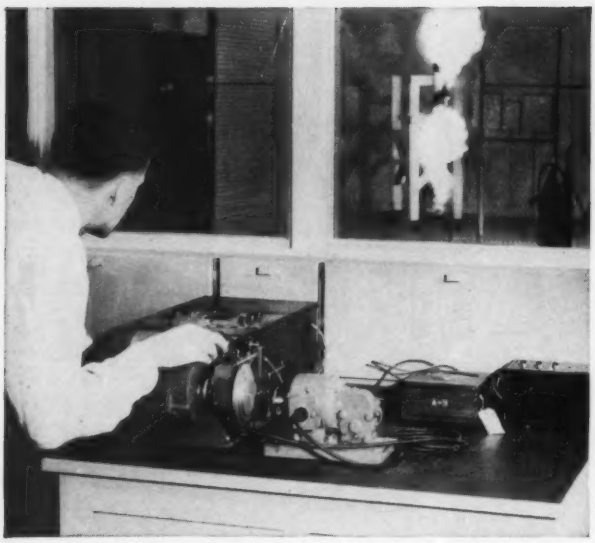
Midwest Engineer

WESTERN SOCIETY OF ENGINEERS FOUNDED 1869

Vol. 6 MAY, 1954 No. 12



Research in L-M's short circuit laboratory—"KNOW-HOUSE." Non-destructive testing of L-M products is performed in open test areas. To the right of the fuse cutout here under test is located a reinforced steel and concrete test cell for testing to destruction. Photography, high-speed motion pictures and magnetic and cathode ray oscillograms play an important part in both types of testing.

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L-M PROGRESS

Line Material makes research an important part of its program, because upon research is based the continuous development of new and better products.

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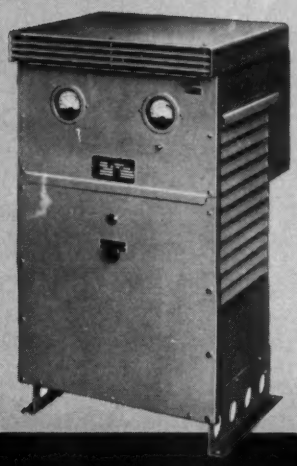
Research and Development

Completely tested and coordinated electrical equipment that brings electric power to home, farm, and factory.

A New Type of D-C Power Source



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Serving the Engineering Profession

MAY, 1954 Vol. 6, No. 12

CONTENTS

COVER STORY

On this month's cover we have a picture showing some of the parking and service facilities available to the Chicago Transit Authority for their new fleet of about 1,000 propane buses. The view is of their North Park. For further information, see the article on page 5 of this issue.

WESTERN SOCIETY OF ENGINEERS

84 EAST RANDOLPH STREET • CHICAGO 1

ANNUAL MEETING AND DINNER

6:00 P.M. JUNE 7, 1954

THE FIRST ANNUAL MEETING AND DINNER TO BE HELD IN OUR NEW ENLARGED FACILITIES

At 6:00 P.M. there will be a social hour and a reception by the officers of the Society. Don't miss this hour of good fellowship.

At 7:00 P.M. one of the main events of the evening will be a delicious dinner featuring a top sirloin steak with all the trimmings for $4.50.

CHARLES E. DE LEUW

WILLIAM V. KAHLER

JOHN F. SULLIVAN, JR.

President De Leuw will then give you a summary of the progress of our Society during the year and will present the awards.

OCTAVE CHANUTE MEDAL TO: JOHN P. CLENNON, The Peoples Gas Light & Coke Co.

Meritorious Service Awards to:

WILLIAM W. POMERHN	Commonwealth Edison Co.
E. A. SCHMIDT	I-T-E Circuit Breaker Co.
CHARLES W. WALKER	Illinois Bell Telephone Co.

Incoming President Sullivan will comment briefly on some of the things he hopes to accomplish during the coming year.

Honorary membership will be conferred upon Mr. William V. Kahler, President, Illinois Bell Telephone Company, who will give the address of the evening "ENGINEERS HAVE WARY EARS."

THE LADIES ARE CORDIALLY INVITED TO ATTEND THIS DINNER
PLEASE SEND YOUR RESERVATION AT ONCE TO AVOID DISAPPOINTMENT

Where Success Begins

By L. K. Sillcox

We have been born into a complex and awesome world. We find ourselves surrounded by strange phenomena and enmeshed in relationships with people and organizations of people. We sense the existence of a Being beyond ourselves and yet can never quite approach this Being. It is the college's job to help students to adjust to this total situation by developing their minds so that they can think, reason, analyze, communicate, evaluate, and decide, and it does so by positive design. Man is different from all else on earth in that he has a mind with which he can attempt to solve the many problems he confronts, not by instinct so much as by reason. His mind tells him that certain work is necessary if he is to have the sort of world, community, and home that he wants. More than that he discovers that he possesses certain aspirations and potentialities simply because of his mind, and these he learns to actualize through learning and leisure.

There is a sharp distinction between play on the one hand and leisure on the other. Play, recreation, or entertainment is a biological necessity, which, like sleep or food, prepares the body for work, whether physical or mental. In this category of play would fall sports, travel, most spectacular activities, most radio and television, the comics and a great many of the books we read, and certainly some of our hobbies. In moderation, such activity is useful and desirable whereas in excess it is harmful to the whole man. Leisure, on the other hand, appears to have something to do with learning and self-improvement, actually leisure consists of those intrinsically good activities which prove to be both self-rewarding and meaningful beyond themselves. This simply means that leisure activities must be good in themselves as helping an individual to realize his potentialities as a person. They must be worth doing. It means, too, that such activities must have some content of beneficial effect upon those around us, or upon society as a whole. We cannot use our leisure creatively unless we know how. We cannot read good books and carry on intelligent conversations if we never succeed in acquiring the art and willingness to do so. Industrialization and the impact of modern science are partly to blame, for they have demanded the specialist and the technical expert, and colleges and universities have been forced to turn to the elective system to solve their dilemma. There is a tremendous load which has been shifted onto educational and cultural institutions through the freeing of men from long hours of toil at a time when there is a larger percentage of the population being given opportunities for adequate education and to a greater extent than in any other part of the world.

The Creator could have formed the earth in perfection and made known its laws to mankind. Instead, He chose to fashion a crude world and to leave its laws unknown, but He delegated to man the challenge and duty of discovering the operating laws of the world and applying them to the development of its resources and in behalf of the good of mankind. These partners in the Divine Scheme of making scientists and engineers useful and essential give meaning to our lives and a precious purpose to be fulfilled. If we accept such a definition and address our lives to its accomplishment, engineering becomes a broader business and a nobler profession than it otherwise could be.

The significant fact emerges that the complexity of the modern industrial plant is constantly demanding more and more specially trained persons to design, produce and administer it and to utilize it effectively. A great nation must at all times exercise an intelligent concern for the proper selection and training of its future leaders, because the extent and character of that selection and training will to a large extent determine how effectively and with what strength the nation will continue to meet and solve its problems. If we are to put this realization into practice, there must be widespread understanding of the fact that we are not at present graduating a sufficient number of students to meet the demand. In a dozen years or so the number of applicants for a college education may be fully double the enrollments of today. We should, therefore, be planning now for their necessary staff, facilities and accommodations so that we may be ready to receive and train these students at this higher level.

About two million young people are now reaching the age of eighteen each year. Because the birthrate was low eighteen years ago that number is smaller than it has been for many years in the past or than it is likely to be for many years in the future. Because the number of these young people is few, the nation places unusually large demands upon them. Farsighted people who are keeping their eyes on the future supply of professional and specialized personnel want those who are qualified to go to college, not for the pleasures of college life, but in order to guarantee for the country a future supply of scientists, engineers, doctors, and experts in other specialized fields. A particularly important demand comes from the present great increase in the total population while the young adult population is low.

In 1900, 4 per cent of the labor force was in the professional and technical fields. In 1950, 9 per cent of the labor force was in those fields. Not all, either in 1900 or in 1950, were college graduates, and certainly not all college graduates were doing specialized work. But more and more emphasis has been placed upon the importance and need of formal training in college or in graduate or professional school as the best preparation

Mr. Sillcox presented this address before the graduating class of the Illinois Institute of Technology in Chicago on January 30, 1954. He is president of the American Society of Mechanical Engineers, and honorary vice-chairman of the Board of The New York Air Brake Company.

for a useful career. In such circumstances, it is obviously desirable to know who goes to college. One answer to that question is given in the following chart. The large upper curve of the figure shows the estimated distribution of scores on the Army General Classification Test (AGCT) of all members of an age group, such as all who reach the age of eighteen, or twenty, or twenty-one in a given year. (No one has ever tested all members of an age group so only an estimate can be offered.) The smaller curve in the figure gives the distribution of those members of the age group who receive college degrees. That distribution is also an estimate. It is based upon recent graduates—mostly in 1950—of forty colleges and universities, and upon all who have graduated from college from among a sample of more than five thousand students who entered high school in the fall of 1942. A comparison of the two curves of the figure brings out several points which are important in considering the future supply of specially trained manpower for the nation (desired score 115). (1) The curve for college graduates covers only about 12 per cent of the area of the total curve, reflecting the fact that about one person in eight now receives a college degree. More than that start college—about one in five—but some of them drop out along the way, leaving approximately 12 per cent of the age group to fill out vital needs. (2) A big majority of the college graduates come from the upper half of the ability distribution. The average score for the whole age group is about 100. The average score of the college graduates is 121. These scores are partly determined by the inherited elements in intelligence, but they are also influenced by the amount and quality of previous education, the amount and kind of intellectual work outside of school, and probably also by the attitudes toward school and intellectual work willed in the home from which the student came. What is said here, represents where you stand today, it emphasizes how grateful you should be for your present status and how earnestly you should aspire to grasp the challenge for a great career of significantly useful service which is yours.

What are the essential qualities of a successful engineer? A tabulation of over fifteen-hundred answers to this question from practicing engineers to whom it was addressed disclosed the following as an average estimate —

1. Character	41%
2. Judgment	17½%
3. Efficiency	14½%
4. Understanding of Human Nature	14%
5. Technical Knowledge	13%
Total	100%

Thus engineers considered 87% of their ability to produce results as based on qualities developed outside of the ordinary university classroom training. Their difficulties were largely life difficulties, not engineering difficulties.

When a problem is once squarely recognized, the solution is sure to follow eventually, be the question one of distance to the earth from the center of the universe measured in light years, or the vicarious teaching to college men of that indefinable, universally-understood quality called "common sense." The problems of active life may be roughly divided into two classes: first, those relating to nature and natural laws; and second, those having to do mainly with our fellow-men.

Students go out into the world to do their constructive work, and in so doing they are nearly certain to find that they are beset at almost every turn with difficult and vexing problems involving the human equation and with personalities inevitably associated with them. Then they come to learn by costly and often bitter experiences that these human problems must be faced realistically. They become aware of the existence of envy, jealousy, spite, hatred, malice, selfishness, avarice, arrogance, injustice, falsehood, double-dealing and other equally hateful and destructive influences. They may even discover, to their surprise, that they are not wholly free themselves from certain of these human blemishes and failings. In any event, they will have to meet them and defend themselves from them as best they may, or run the risk of being overwhelmed by them. Some of you may think that I am taking a very gloomy view of human nature and that I must believe that most of mankind are rascals. On the contrary, I sincerely believe that the great majority of people are essentially honest and generally try to be just. But we

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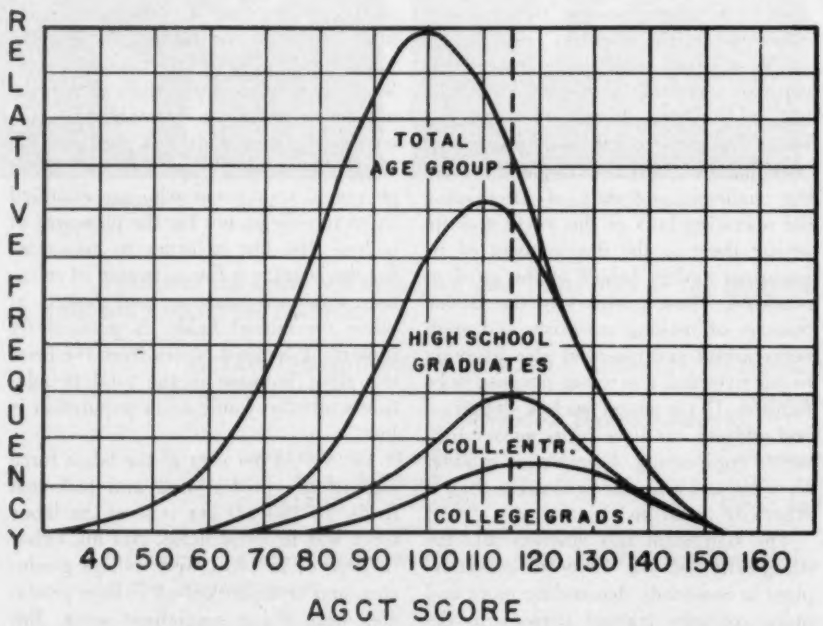

Distribution of ability of a current age group from Armed Forces Tests and those reaching different educational levels. A score of 115 is considered satisfactory for those who undertake engineering assignments. (Source: Commission on Human Relations and Advanced Training)

C.T.A. Pioneers a New Fuel

By J. N. Jobaris

In the early part of 1950, in order to proceed with its modernization program, the Chicago Transit Authority was faced with the problem of selecting and purchasing a large number of motor buses.

Records at that time indicated that diesel-fueled buses were more economical to operate than those using gasoline. The savings in fuel cost per mile was found to be enough so that the first draft of our new specifications accepted only buses with diesel-fueled engines.

At about the same time buses were offered to the passenger transit industry with propane fueled engines. The following claims were made about propane: (1) It had an octane rating close to 125 which permitted higher compression ratios and made increased power available with the same sized engine. (2) The exhaust smoke and obnoxious exhaust odors were completely eliminated. (3) There was no washing away of the cylinder wall lubricants, with consequent longer engine life. (4) There was less crankcase dilution and the periods between oil changes were extended. (5) There was no crankcase sludging. (6) Propane cost per gallon in the Chicago area was considerably lower than that of gasoline or diesel fuel.

Naturally, with claims made like those mentioned we sought knowledge of this new engine fuel. What is Propane? Propane is a hydro-carbon of the same family as gasoline and diesel fuel oil. At normal atmospheric pressures and engine operating temperatures it is a gas. The rural housewife has used this fuel for a good many years. She knows it as bottled gas. It is a "wet" gas which liquifies under relatively low pressures. The fuel is stored as a liquid for convenience in handling. The liquid boils at approximately -44°F. The BTU content is slightly lower than that of gasoline. The main source for propane or LPG is natural gas. It is also a by-product of crude oil refining. While the demand has greatly increased in recent years, the supply seems virtually inexhaustible. Natural vaporization is undoubtedly the most important characteristic of LPG, for good combustion depends upon uniform mixtures of air and fuel in the correct proportions. In gasoline and diesel engines, artificial vaporization is required with some loss of air-fuel uniformity and combustion efficiency. This condition is one of the causes of smoke and carbon monoxide in the exhaust, and unburned fuel in the crankcase. Complete uniform mixtures afforded with the use of propane produces quieter, smoother, and more powerful performance, with less odor and exhaust smoke.

With the war potentiality facing us at that time, and with more railroads and truckers changing to diesel-fueled engines, and with the increased military activity, indications were that industry and government would be reaching toward the center of the crude oil barrel. Since the Armed Forces had hoped that diesel type fuel could be used to propel jet jobs, it appeared that diesel-fuel oil might be classed as a critical material for military needs if a full scale war broke out.

Being a surplus product and a non-strategic material, propane seemed to be an answer. The fact that propane would be readily available at a lower than diesel-fuel cost per mile was a further incentive for checking into LPG as a motor fuel. Checks were made into such items as fire hazards, storage, dispensing, performance, effect on engines when used in outdoor idling, and operation records of people who had used or were using propane. Checking into the insurance costs, it was found that there was no increase in premium rates if the installation of the propane equipment and the fuel handling practices complied with the requirements and safety codes as set up by the National Board of Fire Underwriters, Interstate Commerce Commission and the state and city agencies.

In order to get first hand experience

This picture shows one of the Chicago Transit Authority's 1,000 new propane buses being refueled.

Mr. Jobaris presented this talk at a Noon Luncheon Meeting of the Western Society of Engineers at the Society's headquarters in Chicago on April 14, 1954. He is an equipment engineer with the Chicago Transit Authority.

in CTA's type of operation, a propane-fueled bus was placed in revenue service on February 7, 1950. During the experimental operation it was noticed that the acceleration of the bus was increased and that there were no objectionable odors or exhaust smoke. After running the bus for five months the records were checked and it was found that the fuel mileage was close to that of gasoline-fueled buses. At the end of the test period the engine was dismantled and it was found that there was little carbon formation in the head, on the pistons, or around the valves, and that the crankcase and lubricating oil was surprisingly clean.

With the thought of not getting caught in a position of having many buses available with a limited amount of fuel to propel them (if the military needs increased sharply) and after rechecking the records of the experimental propane-powered bus, it was decided to consider LPG as a motor fuel.

In addition, the Chicago Transit Authority's ordinance with the City of Chicago specifically obligates the Chicago Transit Authority to take definite, positive steps to reduce or eliminate noxious gases resulting from the operation of its buses. The provision was written into the ordinance because of complaints over the years regarding the disagreeable fumes emitted by buses. The businessmen, the people who lived on street car lines converted to bus operation, and most important the passengers, particularly objected to buses which emitted smoke and fumes.

As a result of the above studies the bus specifications were changed and when the invitations to bid for new buses were sent out the specifications accepted either diesel or propane fueled vehicles. When the bids were opened it was found that the propane fueled buses could be purchased for approximately $3,000 less per bus than the diesel-fueled buses. This saving permitted the purchase of more units than was originally anticipated.

The lower initial cost of the propane buses with the attractive fuel contract offered, presented a substantial saving which was vital to the CTA modernization and expansion program.

The bus fuel tanks are the Parkhill-Wade safety type with an internal expansion tank, and have a fuel capacity of 105 gallons. Allowance is made for fuel expansion by installing a small outage tank inside the larger bus fuel tank. Fuel is pumped into the tank to refuel. On filling, the expansion tank is sealed off from the main tank by a valve which is opened after the filler nozzle is removed. The filler connections are fully automatic and present less difficulty than fueling with gasoline or diesel oil. The pumping rate is approximately 30 gallons per minute.

When CTA went to propane it was anticipated that there would be some difficulties encountered with the use of a fuel which was not too common to the bus industry. "Growing pains" were encountered with some of the equipment since city-type of operation places ex-

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Facing the Problem

Professionalism or Unionism

By T. Carr Forrest, Jr.

The issue of professionalism or unionism in the engineering profession is today's challenge to the professional engineers of America. It is a challenge which must be quickly and decisively resolved.

Having just recently completed an extensive tour of the United States, visiting with and speaking to many individual professional engineers, as well as Chapter and State Society meetings, I have been surprised to find a large portion of the profession completely unaware of this issue.

What is the nature of this problem? It is simply whether the engineer will remain a professional man and advance as such, or whether he is going to allow the unionism philosophy to represent him in all his affairs as the device for resolving his economic problems. All side issues such as the theory of the "professional union," are mere sidestepping arguments which beg the main question.

NSPE's position is clear and unequivocal. As a Society we have stated that "it is definitely unprofessional for a professional engineer, professionally employed, voluntarily to join a heterogeneous labor union, dominated by, or obligated to, non-professional groups." As long ago as 1948, our Society declared that "the individual responsibility and independent judgment required of a professional engineer are incompatible with the regimentation fundamentally inherent in unionization." Our statement clearly indicates that labor union affiliation necessarily means the sacrifice of professional status. And I would take it that our position includes the so-called "professional" unions as well as the trade unions.

Let us make it clear that the Society takes no position in matters dealing with the unionization of industrial workers and craftsmen. These are considerations out of our purview.

The naked issue then is whether the temporary economic benefits the unions claim they can obtain for professional engineers are worth the long range loss of professional status. NSPE believes that we cannot have our cake and eat it, too; we must make our choice. Some members of the profession are committed to the union philosophy, a greater number have clearly indicated their preference for development through professional societies, and the largest group stands in the middle, uncommitted to either position as evidenced by their failure to join either a union or a professional society.

The idea of unions for engineers is not a new one. Union activities for professional employees can be traced to the period immediately following World War I when the American Association of Engineers organized and directed a collective bargaining campaign for professional engineers before the U. S. Railway Wage Board in the interest of technical employees of the railroads. That the issue of professionalism vs. unionism is also not new is illustrated by the statement of AAE that ". . . our action stirred up animosity: brought on us the suspicion of employers that we were a 'glorified labor union' . . ." And it is also interesting to note the parallel of 1919 to today; ". . . the entire campaign conformed to the highest principles of professional conduct." So it is seen that the idea of the "professional" union also is not particularly new.

In the years which followed, unions of engineers came into existence from time to time, but it may be observed that they were not regarded by the profession as anything more than a "fringe" element until the past decade. Unfortunately, the adoption of the Wagner Act in 1935, preceded by the collective bargaining mandate of the National Industrial Relations Act, hastened and encouraged the development of engineering unions, to some extent due to the failure to provide different treatment as between production workers and professional employees.

The Taft-Hartley Act of 1947 corrected this deficiency, providing that those defined as "professional employees" must be given the opportunity for determination of their desires on collective bargaining (and decertification questions) by a separate unit vote confined to the affected professional employees. This was a major step forward and reflects credit on the many engineering societies which participated in the work to obtain the much-needed reform. With this provision in effect we have largely eliminated a legal situation which permitted professional employees being forced into trade unions.

A development which has brought the issue to a head occurred in 1952 when representatives of independent engineering unions formulated a national federation of such groups—known as Engineers and Scientists of America (ESA). This group has announced ambitious plans to organize all professional engineering employees into their constituent unions and to organize student chapters on the campuses to inculcate the spirit of unionism among the engineering students.

Some rather loose figures have been widely circulated regarding this group. During my recent travels I often encountered the statement that ESA has 40,000 members. This magic figure came into being based on the claim that the ESA units at the time the organization was founded *represented* 25,000 professional engineers and "other professional units having 15,000 eligibles"

(Continued on Page 13)

This article is reprinted from the March, 1954 issue of AMERICAN ENGINEER. Mr. Carr is a professional engineer, and is president of the National Society of Professional Engineers.

they're off!

As an opening gesture a number of V.I.P.s (very important persons) have entered a competition to obtain new members for W.S.E. Their efforts are recorded from week to week on a chart displayed in the W.S.E. lounge.

Any W.S.E. member automatically becomes a V.I.P. upon bringing in 3 or more new members.

HELP ADVANCE YOUR PROFESSION
BY GETTING MORE MEMBERS!

Anti-Flood Methods Tested by Engineers In Illinois Watershed

"Exercise Jupiter," a two-weeks Corps of Engineers test of flood-fighting methods for the Illinois Watershed, ended Apr. 30.

The imaginary ten-inch rains and the imaginary resultant floods were deliberately exaggerated by the exercise planners at the Great Lakes Division Engineer office here in an effort to sorely tax and test flood fighting facilities in the vast local watershed.

Throughout the exercise the office and field forces of the Chicago District Engineer were pressed for solutions and actions on mounting flood conditions in a dozen river basins which included Desplaines, Kickapoo, Spoon, La Moine, Mackinaw, Vermilion, and Kankakee.

The results of the tests amounted to learned lessons which bolster current flood-fighting plans with sounder techniques which, in turn, promise to the inhabitants of potential flood areas an organized and coordinated defense action in event of an emergency.

The last real flood in the Chicago area occurred in 1943 when the Illinois River and its tributaries overflowed causing a $15 million damage. Since then the Corps of Engineers has built new flood control structures and restored others here at a cost of $16 million.

"Exercise Jupiter," so called for the mythical god of rain, was all part of a seasonal examination of the nation's ability to handle floods. The federal flood control acts of 1923 and 1938 were the authorities for placing the national flood control program under jurisdiction of the U. S. Army Corps of Engineers.

Thus, in addition to military construction, the principal activities of the Great Lakes Division are the supervision and maintenance of canals, waterways, locks and dams, beach erosion, water stages, and flood control.

Operations for these matters in the Illinois watershed are the duties of the Chicago District Engineer. "Exercise Jupiter" fell to him.

Illinois Institute Elects New Board Members

Joseph L. Block, president of Inland Steel company, and Charles C. Jarchow, president of American Steel Foundries, have been elected members of the board of trustees of Illinois Institute of Technology, it was announced recently by James D. Cunningham, president of Republic Flow Meters company, chairman of the board.

Sixty industrial and business leaders serve as active members of the Illinois Tech board. Five others serve in a retired honorary capacity.

Block was elected to fill the vacancy recently created when Wilfred Sykes, MWSE, former president of Inland Steel who is now retired and living in California, was elected to honorary membership on the board. Jarchow will fill the vacancy occasioned by the recent death of William H. Regnery, late president of Joanna Western Mills Company and Chicago's Central National bank.

Block has been associated with Inland Steel, of which his father was one of the founders, since 1922. He became president of his company several months ago. He is an officer and director of the Chicago Association of Commerce, the Community Fund and the Citizens of Greater Chicago.

Jarchow has been associated with American Steel Foundries since 1912 and served many years as the controller of his company. He ascended to its presidency in 1949.

Westinghouse Corp. Will Move Displays

Westinghouse Electric Corporation will relocate its appliance, television and radio national showrooms to the Merchandise Mart in Chicago.

The firm will occupy 9,400 square feet of space on the 11th floor of the building, in the present location of the Good Design exhibit.

Remodeling of the space will begin immediately. It will be completed in June.

Regional offices of the Westinghouse appliance and television-radio divisions, now located in the second floor Merchandise Mart space of the company, will be combined with the new showrooms.

Westinghouse will move its showrooms from the Furniture Mart.

Bigger and Better

The attendance at the Washington Award dinner on Apr. 7 at which Dr. Lillian Gilbreth was honored was not just 500 as stated on page 6 in the April issue of "Midwest Engineer." The attendance was considerably better, totaling well over 700.

Where Success Begins

(Continued from Page 4)

can scarcely live long in the world of affairs and not realize that it is not safe to assume that everybody always means well. It is not good to be over-suspicious, but it is best to be on one's guard. Further than this, it often happens that there is a contention where all of the parties thereto are reasonably honest and intend to be fair. When this comes to pass it is especially important for the young person to understand well both his rights and his duties, and it should be remembered that rights always imply corresponding duties.

Patient persistence, coupled with a degree of cheerful optimism, works wonders in this world. The exercise of those qualities not only keeps our enthusiasm alive, but inspires our associates with confidence and awakens in them an answering enthusiasm. The person of generous impulses who deals with those about him with a kindly frankness and who is disposed to help and encourage those who need it, will reap a rich harvest in good will and in moral support when he requires it. The oft quoted saying, "All comes to him who waits," means nothing if it does not mean that things come to those who know how to wait, the inference being that they are, if possible, helping things along while they wait. There are few things more fundamentally tragic than the person who possesses superior ability, but who achieves nothing because obstacles reduce his efforts to nothingness. A combination of such desirable traits as optimism, cheerfulness, courage, poise, faith, decision, love, generosity, confidence, tolerance, neatness and ability to mind one's own business will produce a very likeable person. Conversely, negative qualities such as pessimism, fear, ill temper, doubt, indecision, hatred, envy, jealousy, false pride, selfishness, exaggeration, and love of gossip will sum up into a disagreeable whole.

Business is built on confidence.

You cannot be any bigger or better than your boss will let you be.

It is not sufficient that we know what is needed to be done. If its accomplishment requires the cooperation of others, we must also possess that rare quality of being able to prevail upon others to help do it. There are leaders of thought and there are leaders of action. The foregoing truth applies in either case, but there are no rules for accomplishing it. The real leader possesses an instinct by which he knows how to secure and merit support. Leadership always requires a very thorough knowledge of the job. If a person does not understand the work he is undertaking to direct, naturally he cannot be expected to be a good leader. The converse is unhappily not true. There are many persons who understand the intricacies of an operation very thoroughly who make poor leaders because they lack this other necessary quality — the ability to make people want to work. Leadership demands as a primary requisite an intimate knowledge of human nature and that is why the person who has schooled himself in his younger days to study people, their reactions, their peculiarities, and mannerisms, possesses a great advantage over the average person. Common sense is nothing more or less than an understanding of nature and human nature. It is a vitally essential quality in a leader. He must understand men and must deal with them as he finds them. You cannot treat all men alike. Some men you merely need to pat on the back and they will go the limit for you. Others are spoiled by that treatment. They will immediately assume that they have become established, and it is no longer necessary for them to exert themselves. There are some men who are naturally lazy and will follow the line of least resistance if you permit them to do so. They must be constantly goaded to do their work. It will never do to encourage such people with the belief that their work is satisfactory. Leadership involves management. It requires resourcefulness and persistence. The man who is willing to take responsibility, who will assume that when he is given a job to do, it is his job and nobody else's and that to him belongs the burden of getting it done, is the man who will forge to the front. A good leader will never place his associates where he is unwilling to go himself. A good leader will, of course, set an example to his subordinates. In any organization the qualities which make for greatness filter down from the top; the example must be set by the leader. A real leader will always delegate authority to his subordinates and is never afraid to share knowledge or information with his subordinates. The real leader will invite suggestions from his men in order to stimulate their initiative.

Technology has made the world a neighborhood and the problems of nations distant in space are no longer matters of mere academic interest, but of vital, immediate concern. The Machine Age, that is the application of artificial power to the tools used by man, may be said to have begun in the middle of the eighteenth century. Its influence slowly broadened out from the English Midlands; new forces, new materials, new designs, new techniques, gave mankind ever greater control over his material environment. Taking stock, two centuries later, it is apparent that the technological advance has swept through almost every phase of human activity. The machine, guided by engineering skill and acting under the stim-

ulus of a free enterprise society has done much to give this continent that great military and economic strength which is now the envy of the whole world. We can well ask ourselves with all seriousness how it is that our independence is firmly based on our proved political competence, and the capacity we have to govern ourselves, buttressed by our advancing standard of living, health and education. Surely technology has accelerated improvements in living standards and in health and it further provides some of the material requisites for education. The machine has given even more leisure until now our average citizen enjoys about a thousand hours more of leisure per year than his grandfather—as productivity rises, the work week shrinks. The question which should engage our attention is whether this triumph of the industrial age is real, or only potential; whether the time saved from required labor is put to useful ends in terms of personal development or frittered away in mass-produced and meaningless amusements. There is no quick or ready answer to this question, but the response of creative leadership to the riddle of the machine, whether in world affairs or community commitments, in aesthetics, morals, and all the realms of soul and spirit, is the most solemn challenge of our time.

Basic to everything we do is the availability of effective manpower. It is a striking fact that seventy thousand scientists and fifty-five thousand engineers, or a total of one hundred and twenty-five thousand men and women, carry the research load of the United States. Of this total about sixty per cent are in private industry, thirty-three per cent in government, and about seven per cent in universities and non-profit institutions. This is an exceedingly small fraction of our total working population, and its smallness points up the importance, first of preserving an atmosphere and environment in which this group can be supremely effective, and second, of making certain that we maintain a steady flow of first-rate minds to the group. Of the above total of one hundred and twenty-five thousand research personnel, less than ten thousand are in our universities and hospitals. This is the group that has the responsibility of sustaining our basic research and of making sure that we are training new staffs—highly competent to carry on and advance the research programs in the future.

Some time ago, we had in our country a team of educators and industrialists from England, brought over under the auspices of the Economic Cooperation Administration to study education-management relationships in our country. The report which they rendered their associates in England was very interesting. They pointed out, for example, how much more extensive is our education in engineering than engineering education in England and how greatly this had affected our technological advance. They further pointed out the great and growing emphasis we employ on preparation for management responsibility which apparently has no parallel in England or in any other country for that matter. In England, as you well know, it has been an exceedingly unusual thing for a man trained in science and engineering ever to move into a position of executive responsibility. With us, on the other hand, it is becoming increasingly true that engineers are coming to play a predominant role in management. There is opportunity in our academic environment to draw upon the resources of technology and of the social sciences in studying methods of operating our increasingly complex technological industries. Here we may come to comprehend the team work that has been traditional in our industrial society, being strengthened through new concepts in research techniques.

The full impact of this development on our industrial life has still to be felt and guided, just as we are only at the beginning of the period of technological advance which the present high expenditures in research promise to make available. Many factors will contrive to help determine the pattern and the rate of our advance in the years ahead. We need more than ever before, increasingly close relationships between management and labor, agencies of government, and institutions of learning, in order that the best possible climate is maintained to enable research, engineering devolopment, and creative enterprise to thrive steadily toward a better future day to come. The only unknown, and it is a large one, is: has industrial leadership what it takes, spiritually, to grasp its golden opportunity? Can it muster sufficient strength, morally and spiritually, to fill the vacuum which is opening before our eyes?

One of the chief problems of large-scale management in both theory and practice is how to combine creative enthusiasm for company projects with cool objectivity of judgment. Both

qualities are necessary to any successful undertaking, but lack of energy and enthusiasm bulks much larger as an essential than does emphasis on objectivity.

There are two important cautions to keep in mind. First, management must have followers. Even more, they must have disciples. The first responsibility of the future manager must be to seek out the companion spirits, the younger men and women who have the right attitudes coupled with necessary talent and training for dedicated creative management leadership in the future. Given this assurance of succession, managerial advance will continue and bear lasting fruit, and more of our younger generation will enter the business world with an abiding faith that creative, responsible management is a high calling. Furthermore, created leisure will, then and only then, become adapted to a program of responsible individual self-improvement and worthy individual performance all along the line, but such a result is not self-starting, it is management's great and dedicated task and privilege to pave the way and set the example.

A New Fuel

(Continued from Page 6)

tremely heavy demands on the engine propulsion and fuel units. Most of the problems are solved and the remaining few should be behind us before the year is out.

The engineering and maintenance staff at CTA are proud that they were given the opportunity to help, along with other transit companies, in the pioneering and development of equipment to utilize propane as a transit-bus motor fuel.

Even after three years of propane operation it is too early to have compiled reliable comparative engine maintenance costs because accumulated mileages on the higher-mileage units have not reached the point where the average-type bus engines require overhaul. However, some data on average cylinder wall wear and bearing conditions is available on an engine which has been torn down several times for wear inspection.

Readings at 50,000 Mile Engine Inspection: Cylinder Sleeves, .0015 (Average Wear); Pistons, .001 (Average Wear); Crankshaft Rod Journals, (No Wear); Connecting Rod Bearings, .0015 (Average Wear), Bearing Clearance, .003.

General sum-up reveals:

1. No crankshaft wear.
2. Very slight wall wear.
3. Bearings good.

CTA has found that propane as an engine fuel offers:

1. Excellent public acceptance. When clubs, picnic, PTA or convention groups charter buses they invariably ask for "one of the new propane buses."

2. Excellent driver appeal. Operators say "the propane buses have good acceleration and the buses do not have any fuel odors."

3. No exhaust smoke or obnoxious odors. As mentioned previously, this is an important item because of CTA's ordinance with the City of Chicago which obligates CTA to take steps to reduce or eliminate exhaust gases and smoke resulting from the operation of its buses.

4. Less frequent oil changes. Twice the mileage between oil changes. Consideration is being given to increase this mileage by 50 percent.

5. No crankcase dilution or sludging

even with protracted idling. For the past two winters over 400 of the buses were stored outside. For several months each winter the engines were run for 24 hours a day.

6. Increased spark plug life. CTA obtains 24,000 miles of plug life with the propane-fueled engines as compared with 6,000 miles of plug life on gasoline-fueled engines.

7. Knocks or ping completely eliminated due to higher octane rating of fuel.

8. Decreased carbon formation on engine parts or in the mufflers.

9. Last, and probably the most important of all, propane-fueled buses offer lower fuel-cost per mile than diesel fueled buses. The last comparative check between buses of the same size operated on the same streets under similar conditions indicated that the fuel cost per 1,000 miles on propane-fueled buses was $37.84 as compared with $43.10 per 1,000 miles on diesel-fueled buses.

CTA's opinion of the use of LPG as a motor fuel is strongly evidenced by the fact that after three years and 65 million miles of operation with propane we have within the past year ordered 400 more propane-fueled buses. The delivery on this second group of buses started in August of last year. To date we have placed about 250 buses of this order in service, or to bring the total up to date, we are currently operating approximately 800 propane-fueled buses. The Authority feels that the exhaust smoke and odor-free propane-fueled bus with its fast-accelerating and quiet-operating engine is the ideal vehicle for Chicago's urban transit motor bus operation.

Professionalism

(Continued from Page 7)

which had applied for admission. There is a vast difference between the number represented and the number who are members of a union. A union certified for collective bargaining at a particular plant or company may "represent" all the professional employees if a bare majority of the group vote for such representation, but this does not indicate that any particular number are *members* of the union.

The recent high demand for engineers has encouraged organizers to become more active in attempts to expand technical unions which sometimes are found under a misnomer with the word "engineer" in the names of their organizations. For, in truth and fact, the percentage of members, who can qualify by law as engineers, is extremely small. It is indicated from reliable sources that the actual membership of ESA is in the neighborhood of 13,000, not all of whom are professional engineers. From the standpoint of registration as the criterion of professional status, it is understood that ESA officials admit that less than ten per cent of their members are registered under the state engineering registration laws and some estimates have placed this statistic as low as three per cent.

One other union group requires mention — the American Federation of Technical Engineers, affiliated with the American Federation of Labor. This group, while using the word "engineer" in its name appears to have practically no membership among professional engineers, being confined to technicians or machinists of one kind or another. The professional philosophy of the AFL union can be gleaned from its statement before the Wage Stabilization Board: ". . . in modern industrial management the engineer is more closely akin to the machinist at his lathe and the production worker on the line." Insofar as membership is concerned, this is another group which does not announce actual membership figures. But the 1953 Directory of Labor Unions in the United States, published by the U.S. Department of Labor, lists the membership at 6800.

Some important thinking on the unionism question will be found in the report of the Professional Engineers Conference Board for Industry, "How To Attract and Hold Engineering Talent." Chapter VI, titled, "What About Unions?," indicates that of 1400 professional engineers (including engineers-in-training) employed in industry, 66% do not want union representation and only 3% belong to unions.

A survey conducted by the American Society of Civil Engineers, covering approximately 17,000 members, revealed that 63% are opposed to collective bargaining.

These findings indicate that a substantial majority of the profession have not been deluded into thinking that unionism is the answer to their problems, but they do indicate that a substantial portion of the profession are at least "flirting" with unionism.

Why do we say that professionalism and unionism are incompatible concepts? Examples, rather than philosophy may provide a more impressive answer.

In recent months a large eastern newspaper carried the headline, "RCA Engineers Announce Strike." The next day the headline was: "RCA Engineers Call Off Strike." The point here is not whether the engineers were right on the economic questions involved or whether management had taken an unjustified position on certain points in the dispute. Here was a case where a union of professional people called upon their weapon of last resort to force their point of view. Regardless of the issues, can professional people go before the public one day in terms of strikes and picket lines, such as are used by production workers, and go before the public an-

other day, as we do during National Engineers' Week, talking of public service and asking for public blessing and recognition as a learned profession?

Another engineering union and another company had a dispute and the newspapers announced to the public that the engineers had "struck." The public was also told that representatives of the Defense Department were alarmed over the loss of vital defense production and that the situation was becoming "increasingly critical." What sort of professional impression can we make on the public when the interests of a striking group of professional men are put before the defense of the nation? We do not need to pass judgment on the claims of the strikers to know that the public will not and cannot understand such actions from "professional" men.

The engineering unions contend that they can operate in a professional manner and without sacrifice of the individualism which is inherent in a profession. But a review of a collective bargaining agreement between one of the nation's largest employers of engineers and the engineers' union, a 58-page document, indicates coverage of everything from standard work schedules to vacations, from general adjustment in rates of pay to layoff allowances, from occupational classifications to professional standards, and on and on to the extent of 35 separate subjects which govern the daily working life of the professional employees. When an individual professional engineer is "represented" by force of law and collective bargaining agreement to the extent of almost every phase, detail and aspect of his professional activities, it cannot be successfully maintained that collective bargaining is compatible with professional status. If professional development and advancement are to be regulated in 35 ways the individual may or may not climb the professional ladder, but he will climb it, if at all, only on the rungs which are contained in the "agreement" and he will climb it no faster than the "agreement" permits.

If professional engineers are fair game for unionism they are fair game for all kinds of unionism. The trade unions will not idly sit by if engineers are to be organized without putting their finger into the pie. Such an endeavor is now taking place among the engineers and surveyors working for contractors building the Ohio Turnpike, and the organizational efforts of the trade union appear to be spreading to other states. The trade unions have more experience and power than the so-called "professional" unions. And if the individual professional engineer is looking only for immediate economic gain at the expense of all else, why should we assume that he will not cast his lot with trade unionism rather than "professional" unionism?

It is also self-delusion to think that "professional" unions can effectively operate outside of the traditional rules and without the traditional weapons of trade unionism. We have already observed the use of the strike and the picket line by "professional" unions, and whether they desire it or not, they will have to resort to boycotts, featherbedding, compulsory membership and all the other usual methods.

A recent article by Dean W. R. Woolrich, president, American Society for Engineering Education, (AMERICAN ENGINEER, April, 1953) listed the following effects of unionization of engineers:

1. Individual initiative would be restricted.

2. Individuals would be regimented by the union organization.

3. A "typing" of engineering positions and a "leveling" of salaries would result.

4. Professional status and prestige of engineers would be damaged if not lost entirely.

5. Individual advancement and recognition of individual achievements would be stifled.

This is an age of organization and group action. Nothing we say or do can change this condition. What then can the engineering personnel of industry do to advance their professional and economic status short of unionism? They can, it is submitted, start with the premise that all engineers in a particular company, supervisor or employee, are part and parcel of one and the same profession. They can affiliate as a professional group to discuss, consider, work on and in every other way deliberate together about their problems as professional people. They can educate each other and management: they can recommend suggested changes of procedure and status. They can, in short, apply intellectual engineering thinking to their professional interests. To say, as the unions do, that management will not heed such constructive and cooperative approaches is to fly in the face of experience. American industry has advanced just because of such mutually profitable activity and not by being arbitrary and without regard for constructive thinking.

There are technical obstacles in the

way of a greater development of non-bargaining engineering organizations and NSPE has sponsored an amendment to the Taft-Hartley law to remove the obstacles. Whether this legislative effort will succeed depends in large part upon the active support of the members of the profession, as well as those industries whose growth depends upon technological know-how. It is our purpose to bend every effort to obtain the needed change, which we call the "Freedom of Association" amendment. We are convinced that it will open a new vista for meeting the profession's problems in the industrial field.

The other thing we can and are doing is to obtain a sympathetic understanding of the problem of engineers in industry, to cooperate with them and to seek solutions to those problems on a variety of fronts, including ever-closer contacts and understanding relations with management. The recently formed NSPE Engineer in Industry Committee is dedicated to this task and has developed an ambitious and practical plan of worthy endeavor.

When industrial organizations employ engineers on assignments of a sub-professional or clerical character, the end result is likely to be frustration, retarded professional development and at least the danger of opening the door to the acceptance of the collective approach inherent in unionism. In these times of high demand for engineering manpower, industry can ill-afford to use these professional talents for other than truly professional work.

Industrial America needs the engineer in its business more than ever before. Industry cannot stand still. It must continue to make improvements in the products it sells. It must keep moving forward rapidly on research and in the development of new products to take the place of old ones that have lost their lustre.

The basic ingredient in the complex industrial colossus that typifies the United States today is engineering know-how. Know-how in research, know-how in design, know-how even in the design of new tools which may be necessary to efficiently and economically assemble the new product. As a result of all this, industry is rapidly turning to the engineering profession for administrative and executive leadership. Why? Simply because it is this kind of person who can more readily grasp the significance of research, design, manufacture and sale of the product.

By following this philosophy, which is borne out by the ever-increasing number of engineers in industry (now as high as one in twenty), I come to the natural conclusion that *all* engineering phases of industry from the new graduate on up is a part of management. The engineer creates and designs the product, he designs the machinery to make it and he instructs the public in the use of this same product. It is his brain, not his muscle, that is integrated into the complexities of a modern industrial plant.

My experiences of recent months have convinced me that we face a major problem and that we must meet it head-on; it has equally convinced me that with the determination of the engineering profession to remain a profession we can achieve our goal of continuing professional development and public service.

Industrial Beauty Is A Part of Defense

Progressive community planning to preserve the natural beauty of industrial sites is important as a national defense measure, according to A. Humphreys, camouflage expert of the Engineer Research and Development Laboratories, Fort Belvoir, Virginia. It simplifies camouflage of industrial nerve centers, which has become increasingly vital with the world wide expansion of air power.

Natural terrain contours along with trees and other natural foliage are extremely important in concealing or changing the appearance of an installation, Humphreys points out, because almost every scheme is based on the blending of an installation into its surroundings. Thus the preservation of natural formations and the location of buildings dictated by the existing terrain reduces the construction and maintenance problems involved in camouflage.

The importance of natural surroundings was unmistakenly apparent in the attempts to camouflage important facilities during World War II. Most of these had grown as necessity dictated or were designed without thought of camouflage. Natural terrain features and vegetation were destroyed. Thus camouflage was made not only more difficult and expensive but in some cases impossible.

Artificial camouflage materials, such as paints and nets, have been developed, many of them by the engineers, physicists, architects and artists in the Camouflage Branch which Humphreys heads at the Engineer Laboratories. These, he stresses, are intended primarily to supplement natural materials and objects.

Progress of E.S.P.S. Is Sketched

The first joint effort of the Engineering Societies to establish an Employment Office was in 1918. The Service was managed by a Board made up of the Secretaries of the four Founder Societies and all funds for its maintenance were provided by these Societies. Prior to 1918, each of the four National Engineering Societies had operated free employment services to their members. On January 1, 1921, the management of the Bureau was taken over by the Federated American Engineering Societies and was known as the Employment Service for that organization.

The management was taken over, in 1923, by the Founder Societies, the Boards of Direction inaugurating a new policy respecting the Service. This action was based upon the report of a Joint Committee, representative of the four Societies, which recommended among other things a cooperative plan of operation. Under this new arrangement, free service was discontinued in favor of a plan to be financed in part by the Societies and in part by those who benefitted in having received positions through the efforts of the Service. Use of Service was confined to members of the four National Societies and cooperating organizations until 1929, when it felt that more effective service could be rendered by allowing non-members to use the Service at a slightly higher charge. This plan also called for the establishment of offices throughout the country as conditions permitted so that in time the Service might become more truly national in scope.

Pursuant to this policy, an office was opened in Chicago in 1925, administered by representatives from the Sections of the Founder Societies in Chicago in cooperation with the Western Society of Engineers which assisted in its financial support. Another office was opened in San Francisco in 1926, administered by representatives from the Sections of the Founder Societies in San Francisco and in financial cooperation with the California Section of the American Chemical Society and the Engineer's Club of San Francisco. In 1940, offices were opened in Detroit and Boston in cooperation with the Engineering Society of Detroit and in Boston in cooperation with the Affiliated Technical Societies of New England. This later office was closed after several years operation when it was found that New England could be served as well by the New York Office.

In addition to the policy of the establishment of additional offices throughout the country, a further expansion of the Service was made to permit other National and Local Engineering Societies to affiliate with the Service and accordingly the Society of Naval Architects and Marine Engineers, and the Illinois Society of Professional Engineers became active participants in our operations and their members are eligible to the same benefits as the members of the other participating Societies.

Also, in 1940, it became necessary, because of a Federal Internal Revenue Tax ruling to incorporate the Service as a separate corporation on a national basis and accordingly a new non-profit corporation was formed, the directors being two persons nominated from each of the four National Societies. This Board determines policies, chooses an Executive Director and his staff, determines compensation to be paid to the staff and considers reports of performance. The direction and management of the several offices is under the Executive Director (who is responsible to the Board) and the Office Managers, who are responsible to the Executive Director for the effective and economical operation of the office to which they are assigned. An Advisory Committee may be appointed by the participating society groups to bring the maximum cooperation of local groups into the operation and usefulness of the local office.

Originally the ESPS was financed by contributions from the Four Founder Societies and with some assistance from the local engineering societies where branch offices were established. During 1927-1929, the contributions advanced by the local groups had been paid back in full by the Service and in 1936, an effort was made to relieve the Founder Societies of this financial burden and to make the Service self supporting. Up to that time the combined contributions of the Founder Societies had been over $150,000, none of which has ever been returned to the Societies. Accordingly, since 1940, when the Service was set up as a separate Corporation, no financial assistance has been received from the Founder Societies. During the past fourteen years the Service has been

able to build up a surplus to help meet such conditions as have prevailed in the past, when there is a dearth of employment opportunities and naturally a great reduction in the normal income received through placement fees. It is the expressed policy of the Board of Directors to build up the reserves in the National Treasury to a point where new offices could be established and also sufficient to carry on the work of the Corporation for several years with insufficient annual income. This goal has not been achieved to date.

Something of the effectiveness of the Service may be gauged by the fact that for the 28 year period from 1925 to 1953, *114,538* Engineers have been registered, *103,034* Positions have been received for filling, and *32,471* Placements have been made.

This is indeed a remarkable showing when it is considered that Engineers equal to about 25% of the combined memberships of the Founder Societies have been assisted by the Service upon one or more occasions. The extent to which the Employment Service has served the members as well as the needs of employers in all phases of engineering and industry, makes this a very worth while activity.

Bulbs Defy Boosters

Electric light bulbs for pinball machines have been developed by Westinghouse to withstand the wallops-on-the-sides by players who enthusiastically try to boost their scores. Lamp filaments are hand-mounted on supports specially designed to withstand shock.

CRERAR LIBRARY
News and Notes

The spring meeting of Crerar's Board of Directors was marked by the election of Herbert P. Sedwick as president, succeeding Edward L. Ryerson who remains a member of the Board. Mr. Sedwick is well known to members of the Western Society of Engineers, having served as their president in 1950-51 and playing an active part in the development of the engineering societies' center. A member of Crerar's Board since 1953, he is president of the Public Service Company, executive vice president of Commonwealth Edison Company, and a trustee of Illinois Institute of Technology. Mr. Sedwick's professional affiliations include membership in the American Institute of Electrical Engineers. Crerar welcomes his wide experience with the engineering profession and in educational organizations.

* * *

On May 5 the Librarian, Herman H. Henkle, spoke at the District Meeting of the Indiana Library Association in La Porte, Indiana on services which can be extended to business and industry by the small and medium-sized public library. He described ways in which the public library can serve as a clearing house for business and technical information available through not only the various agencies of the local community, but also through state and national agencies.

The second in a series of exhibits set up in the WSE lobby features a Japanese work, the *Kokon Tanko Meikan* or Illustrated History of Coal Mining. Published in 1953 by the Koboyama Coal Institute, it contains colored reproductions of old prints picturing early Japanese mining practices and continues to the present day with photographs of mines in Germany, Scotland, America and elsewhere. Beautifully bound in silk, the volume has with it a decorative Oriental case, complete with bone clasps. Text and tables are printed in both English and Japanese.

IIT Offers 115 Summer Courses

Approximately 115 courses in engineering, science, and liberal studies will be offered at Illinois Institute of Technology, Chicago, during the summer session beginning June 28.

Both day and evening classes are being scheduled in undergraduate and graduate work by 18 departments of the school.

Areas of study include psychology, mathematics, biology, business and economics, chemistry, language, literature and philosophy, political and social science, technical drawing, art education, mechanics, home economics, and six fields of engineering.

Registration for day classes will be held from 8 a.m. to 3 p.m. Thursday, June 24, at 3300 Federal street. Evening classes will be enrolled from 6 to 8 p.m. Wednesday, June 23, at the same location. Classes will continue through Aug. 20.

WSE Applications

In accordance with the By-Laws of the Western Society of Engineers, the following names of applicants are being submitted to the Admissions committee for examination as to their qualifications for admission to membership into the Society in the various grades, i.e., Student, Associate, Member, Affiliate, etc. All applicants must meet the highest standards of character and professionalism in order to qualify for admissions, and each member of the Society should be alert to his responsibility to assist the Admissions committee in establishing that these standards are met. Any member of the Society, therefore, who has information relative to the qualifications or fitness of any of the applicants listed below, should inform the Secretary's office. The Secretary's office is located at 84 East Randolph Street. The telephone number is RAndolph 6-1736.

200-53 George W. FitzGerald, General Traffic Engineer, Illinois Bell Telephone Co., 212 W. Washington St.

201-53 Warren E. Kuehl, Engineer, Illinois Bell Telephone Co., 208 W. Washington St.

202-53 Miss Willa Feakins, Mech. Designer-Checker, The Bastian-Blessing Co., 4201 W. Peterson Av.

203-53 Joseph A. Klein, Designer, Sauerman Bros., Inc., 522 S. Clinton St.

204-53 John D. Simpson, Engineer of Construction, Ralph H. Burke, Inc., 20 N. Wacker Dr.

205-53 Robert J. Pinske (Rein.), Power Plant Engineer, Crane Company, 4100 S. Kedzie Av.

206-53 W. R. Gemmel, Engineer of Prod. Dev., Teletype Corp., 1400 Wrightwood Av.

207-53 Hugh C. MacDonald, Jr., Regional Engineer, Structural Clay Products Institute — Region 5, 228 N. LaSalle St.

208-53 James E. Dow, Vice Pres.-Construction, Kelso-Burnett Electric Co., 223 W. Jackson Blvd.

209-53 Donald L. Baxter, Executive Engineer, Reliable Electric Co., 3145 Carroll Av.

210-53 Robert D. Schwob, Engineer, Reliable Electric Co., 3145 Carroll Av.

211-53 George F. Bishop, Jr., Structural Field Representative, Portland Cement Association, 111 W. Washington St.

212-53 Howard J. McGinnis, Quality Concrete Engineer, Portland Cement Association, 111 W. Washington St.

213-53 Jack H. Rohlfe, Field Engineer, Portland Cement Association, 111 W. Washington St.

214-53 Gordon J. Stepanek, Housing & Products Representative, Portland Cement Association, 111 W. Washington St.

215-53 Robert D. Albertson, Field Engineer, Fairbanks, Morse & Co., 1550 S. State St.

Pay and Supervisor Cause Men to Quit

The most important sources of grievance when an employee quits his job are the pay and his supervisor.

This was revealed in a survey reported in the current issue of the Journal of Applied Psychology by Willard A. Kerr, associate professor of psychology, and Frank J. Smith, graduate student, both of Illinois Institute of Technology, Chicago.

The survey was based on the results of questionnaires received from "exit interviewers" at 48 companies throughout the nation which report 5,075 quitting cases yearly.

"Exit interviewers" are assigned to talk to quitting employees, who, according to Kerr and Smith, are in a mood to express their feelings and speak frankly about job difficulties.

The survey returns indicated that almost two out of every five reasons for quitting involved pay. Next in frequency were transportation, promotion, working conditions, poor health, and job security.

The Illinois Tech researchers also found that the lack of "ability of the supervisor" appeared in four out of five patterns which were characteristic of why employees quit their jobs. This was probably the most important outcome of the analysis, they said.

One of the quitting patterns included the supervisory ability along with transportation grievances and lack of "confidence in management."

Smith and Kerr cited an example of how this might occur: "It appears probable," they said, "that employees living far away from the plant have more transportation difficulties and, therefore, are tardy or absent more frequently than other personnel.

"The supervisor (of this pattern) categorizes mentally and orients to these employees as being of the 'less dependable, tardy, absentee type.' Gradually the distant-living employee perceives this apparent untrusting attitude in the supervisor, and he develops a reciprocal lack of confidence in the management.

"Eventually, according to this plausible interpretation, he ends up in the exit interview complaining about transportation, the ability of the supervisor, and lack of confidence in management."

American Output Increases 16 Per Cent

Output per man-hour in the median American industry increased 16 per cent between 1947 and 1951.

This was announced March 4 by Leon Greenburg, chief of the productivity division of the U. S. Bureau of Labor Statistics, who spoke at a Work Study conference at Illinois Institute of Technology in Chicago.

The median productivity gain of 16 per cent during the post-war period is a preliminary, unofficial figure, Greenburg said. The final figure may be affected by industries which show a very high rate of increase or decrease.

Indications are that a number of industries will show productivity increases of more than 50 per cent, he said. He did not name any specific industries in this group.

"During World War II," Greenburg said, "the rate of productivity increase was slowed down because of the problems of military production. For example, from 1939 to 1947 the median industry increased its output per man-hour by 8 per cent or only 1 per cent annually.

"Thus, over the entire 12-year period of 1939-51, the median industry gain was 24 per cent, or 2 per cent per year."

It is too early to determine, Greenburg said, whether this 2 per cent figure represents a new long-term trend in American productivity. Previous studies by the Bureau of Labor Statistics indicated a long-term trend of a 3 per cent annual gain.

Comparing U. S. and Russian productivity, Greenburg said that Russia's output increased 13 per cent per year from 1946 to 1950, according to U. S. S. R. statistics. By 1952, however, it had declined to 6 per cent.

"Even though these figures are possibly exaggerated," Greenburg said, "there is ample evidence that Russia has been expanding its factories and capital equipment. According to one expert, Soviet industrial output will increase 8 per cent annually with the result that by 1970 productivity there will be four and one-half times as great as in 1950."

Greenburg addressed 200 industrial engineers and plant management executives attending the two-day Work Study conference on the Illinois Tech campus.

Dr. Marvin E. Mundel, associate director of the management center at Marquette university, spoke at the opening session of the conference.

"Productivity," he said, "is the basis upon which we stand or fall today, and work study is the democratic approach to productivity. It is the American way as opposed to the authoritarian approach in which the worker is told where he must work and how much he must produce."

Economy of 480 Volts In Buildings Is Noted

The large, modern office building, with its spiraling power requirements, can be more economically served by a 480-volt system than by the 208-volt widely used now, according to Power, McGraw-Hill publication.

Cost comparison studies based on assumed costs, show savings with higher voltage can reach $30 per kilovolt-ampere, the magazine says.

Today's office building loads, the publication points out, run about two-to-five volt-amperes per square foot for general area lighting, two-to-five va per square foot for power load, one-half-to-two for miscellaneous loads, business machines, water coolers, appliances, etc. Total load in yesterday's office buildings was but one-and-one-half va per square foot.

This marked load increase makes the 480-v system particularly appealing for larger buildings; the minimum-size building at which 480 v becomes economical, may range from a few hundred to a few thousand kva, the magazine says. Determining factors are often availability of the higher-voltage power supply, type load, and building configuration.

Though installation costs vary widely in different areas, the magazine notes, as actual installation costs increase, the pendulum swings farther in favor of the 480-v system since there is generally less equipment installed compared with a 208-v setup.

Cable or bus (main conductors of electric current) show the greatest savings at the higher voltage; the same kva can be carried with less voltage drop and less copper than at 208 v. Also, the longer the run and the heavier the load, the greater the savings will be with a 480-v system.

There is a significant difference in the motor-control costs, the magazine continues. A 15-hp, 480-v fusible combination motor starter lists at $162 while a 15-hp 208-v unit lists at $203.

Building configuration plays its part in the cost picture. A relatively small ground area with a very tall building presents the greatest savings with 480 v because of the risers (vertical runs of cable or busway for conducting power from one level to another in a building). A low building supplied near load-center areas shows a minimum saving in risers since they're of minimum length.

Higher rated short-circuit protective equipment must be used on a 480-v system. Short-circuit current is not reduced as rapidly at 480 as at 208 because of circuit impedance. The reduced effect of circuit impedance at the higher voltage is an advantage, if adequate protective equipment is used, since on short circuit this equipment operates faster to isolate the fault.

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C-1790(c) Forest Products Eng. Educ: Forestry Degree. 3 plus years exp. in hardwood sawmill, or wood wastes. Duties: working with men in (a,b) on initial survey, and then remaining to oversee the implementation of recommendations and acting as general consultant to enterprise. This job, anticipated to be 2 years duration. Sal.: Up to $700 mo. plus. 25% overseas allowance. dep. on exp.

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Generator Has Double Power

A new type generator that packs twice as much power as was previously possible in a machine of its size has been installed by the Westinghouse Electric Corporation at Niagara Mohawk Power Corporation's Huntley Station, it has been announced.

Henry B. Vidal, New York State district manager for Westinghouse, said the new turbo generator — the world's first completely inner-cooled unit — is rated at 100,000 kilowatts but it is only slightly larger than the average 40,000 kilowatt machine.

Site of the installation is less than 20 miles from Niagara Falls where the new unit would more than match the 80,000 kilowatt output of the 20 generators of Niagara Mohawk's Edward Dean Adams Power Station—the world's first large scale alternating current generating station.

The generators at the Adams Station, the first three of which Westinghouse installed nearly 60 years ago, are rated at 5,000 electrical horsepower each and are operating today.

Vidal said the new inner-cooled generator of the Huntley Station represents "the culmination of 15 years of engineering effort which broadens the horizon of power generation to unprecedented limits."

"Though this new machine is rated at 100,000 kilowatts," he commented, "it weighs about 47 tons less than a conventionally-cooled unit having the same rating. The secret of its extra power capacity is found in the new way engineers have devised to carry off heat produced inside the generator."

The principle of inner cooling is explained ths way by Westinghouse engineers at East Pittsburgh, where the new generator was built:

The coils of both the stationary and rotating parts of the machine are cooled internally by passing hydrogen gas through them at high speeds instead of over their surfaces as in the former method. This permits the gas to carry away a greater amount of heat from the materials where the heat is generated. In the conventionally-cooled machine, the gas is able to pick up only the limited amount of heat that seeps through the insulating jacket covering the coils.

Pointing out that this method of cooling generators paves the way for the construction of units having ratings of heretofore unbelievable magnitude, Vidal said:

"The electric power industry has been expanding at such a high rate during recent years that the generating capacity is being doubled approximately every decade. In parallel with the growth of electric power systems, there has been a corresponding increased demand for high speed generating units of larger ratings.

"Prior to the Westinghouse system of inner cooling both rotor and stator, however, increases in generator size were limited principally by mechanical requirements, strength of materials and shipping facilities. Now we can build generators more powerful than ever before and still reduce their size."

Because the inner-cooled generator weighs less than one cooled by conventional means, it does not require as heavy a supporting foundation, Vidal said. This means a considerable saving in powerhouse construction and size and, consequently, another way of keeping electric power costs low.

A Truck Crane Solves a Problem

An unusual solution to a materials and equipment handling problem—expected to effect a saving of 75 per cent in man hours—has been provided by anchoring a four-ton truck crane atop the steel structure of a bank building under construction in Dallas, Construction Methods and Equipment, McGraw-Hill publication, reports.

The unit makes 30 lifts per day, hoisting from 1,250 to 4,000 pounds per lift. It is located on the top (40th) floor in such a position that it can service the eight-floor wing, which will house the bank proper, and also the entire tower of the building, without the hazard of hoisting directly over any of the surrounding busy streets.

A guy derrick on the 40th floor was used to hoist the crane, partially dismantled, to the top of the building, and it was mounted on a square base. A special, single drum was built for the handling of over 600 feet of cable; the crane is equipped with a 30-foot boom which operates at a set radius of 25 feet. To speed handling of materials, two large skips or baskets were built from steel screen; the material is loaded into them and hoisted to the desired floor.

Decision to use the arrangement was made after it was found that the cost of using a boom with a remotely located hoist or any similar method would be prohibitive.

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Deakins Makes Plea for Education

A plea for the elimination of economic barriers to higher education was made March 23 by the dean of students at Illinois Institute of Technology, Chicago.

"The needs of our country demand that we do something to eliminate the economic barriers for those who have the capacity and the interest to benefit by additional education," Clarence E. Deakins told the National Association of Power Engineers meeting at the Sherman hotel, Chicago.

He warned that the United States must make use of its vast reservoir of brain power if it is to fulfill its role as leader in world affairs.

Deakins saw a bright spot in the picture as he noted that industry is awakening to the great need and is setting up increasing numbers of scholarships for persons who cannot afford a college education.

He urged the power engineers, who recently created a $1,000 scholarship at Illinois Tech, and other professional organizations to continue to create scholarships.

"I am sure that each of you can think now of at least one bright lad in your local high school whose brain and abilities America needs—IF he has the money to attend college," he said.

"What a great opportunity to invest in the future greatness of America!—and this opportunity lies right in the high school in your home town."

The United States has reached its present position, Deakins asserted, because it realized long ago the necessity of educating people in every social level of the population.

But he pointed to results of a recent survey showing that 72 per cent of the upper class attend college, 58 per cent of the middle class, 16 per cent of the lower middle class, and fewer than 1 per cent of the lower class. The results of other studies have been the same, Deakins said, the income of parents preventing many from going to college.

He warned that estimates of future engineering graduates are not enough "to service our existing military and industrial needs and at the same time to meet the challenge of our greatly expanding needs."

The U. S. Bureau of Labor Statistics, he said, estimates that we will need an average of 30,000 engineers graduating each year to meet the normal demands for replacements during the period of partial mobilization. However, he said current predictions are there will be 17,000 engineering graduates in June, 1954, and 20,000 in 1955.

Reviews of Technical Books

Structural Steel

Design in Structural Steel, by John E. Lothers, Prentice-Hall, Inc., New York, 1953. 454 pages. $7.50.

The author points out in his preface that this book has been written with three groups in mind; the student, the practicing engineer and the instructor. There is little doubt, however, that it is tailored more to the special needs of the student than to the practicing engineer or the instructor.

Design procedures are clearly presented and followed directly by illustrative problems and practice problems. Answers are given for many of these problems and in most cases the procedure is outlined in such detail, that the average engineering student should be able to solve the problems with little or no additional assistance. This book seems especially suitable for beginning designers and students who wish to study the subject on their own.

E.V.

Prestressed Concrete

Prestressed Concrete, by Yves Guyon, John Wiley & Sons, Inc., New York, 1953. 543 pages. $12.00.

Monsieur Guyon's original book "Beton Precontraint" published in 1951, has been freely translated into an English edition titled "Prestressed Concrete." Minor changes and additions were made while English units were substituted for metric units.

The book is sectioned by three general areas of study entitled: PART I — General Considerations, PART II — Elastic Design of Simply-supported Beams, and PART III —Tests of Simply-supported Beams. The first of these three parts treats, in order, design principles, manufacturing methods and plants, materials, frictional losses along cables, fire resistance, anchorage zone stresses in pre-tensioned and post-tensioned beams and bed anchorage. The second part of the book proceeds to treat the details of elastic design methods pertaining to simple beams of constant cross-section with constant area steel, constant cross-section with stopped-raised cables and lastly, variable depth cross-sections. Part III describes the tests upon simply-supported beams. The results of these tests on pre-tensioned and post-tensioned beams are correlated with ultimate load analyses and the associated factors of safety.

The book examines in detail all the elementary material needed as a prerequisite for designing simple prestressed concrete structures subjected to statically determinate bending and shearing forces. However, there have been published in the past year a number of papers on prestressed concrete design procedures. At least two of these papers propose equations for directly determining section moduli of prestressed concrete beams subjected to specified bending moments. One of these papers, in addition, presents a method of design for statically indeterminate prestressed concrete structures.

The book in general is sound for elementary principles and experimental results of tests upon simple beams.

K.B.

Construction Methods

Construction Methods and Machinery, by F. H. Kellogg, Prentice-Hall, Inc., New York, 1954. 415 pages. $7.50.

This book is written in three parts covering the field of construction. Part one discusses operational management considering organization and planning, control and equipment economics.

Part two which is concerned with machinery discusses power, transportation, hoisting and conveying and pumping.

Part three which constitutes a little more than half of the book discusses construction methods. A number of practical problems are treated with examples for computations. Chapters on preparation of a site, earthworks, rock excavation, foundation treatment, aggregate preparation, concrete and structural erections are included.

The material is presented in an excellent manner. A number of problems at the end of each chapter help to demonstrate the theory. A comprehensive bibliography is included. This book is recommended reading for those who are interested in the construction industry.

R.G.O., W.S.E.

Pumps

Pumps, by Frank A. Kristal and F. A. Annett, McGraw-Hill Book Company, Inc., New York, Second Edition, 1953. 373 pages. $6.50.

This second edition is the result of a comprehensive revision of the original published in 1940. Material has been added to several chapters to bring the book up to date. Two chapters included in the first edition, the one on drives for pumps and the other on new pumps for old, have been deleted from this edition.

New applications for diaphragm pumps and the new designs which have recently been developed are discussed in additional material in Chapters I, X and XI. The material in Chapter IV on regenerative turbine pumps has been completely revised. New material has been included in the rotary-pump field. A section has been added on jet-pump design and applications.

This book is well written, giving a comprehensive, practical study on selection, installation, operation and maintenance of the different types of pumps available.

R.G.O., W.S.E.

Aluminum Firm Builds Huge Plant

One of the largest single integrated engineering facts in history is transforming an area the size of Wales into a power system to feed what eventually may be the world's biggest aluminum smelter, Engineering and Mining Journal, McGraw-Hill publication, reports.

This hydro-electric project is being built by the Aluminum Company of Canada in British Columbia's Coast Mountains. Planned in three stages, it ultimately will have 2,240,000 hp installed capacity, the magazine says. First stage will have 450,000 installed hp and an annual production capacity of 83,000 metric tons, and commercial production is expected to get underway in July. Up to 9,000 workers have been working three years on the project.

When the third stage is completed, the smelter will be capable of producing 500,000 metric tons annually. Rate of development of the second and third stages will hinge on market demand for aluminum.

Huge Potential

British Columbia was chosen as the site because of the huge undeveloped hydro-electric potential there, the magazine states. Previously only one-tenth of BC's 11-million potential had been harnessed.

In the area chosen, waters flowed eastward pouring through the Nechako Canyon into the Nechako River, a tributary of the Fraser River. Only at the western end of the watershed, at Kemano, could advantage be taken of the half-mile drop to sea level. By damming the Nechako River, the waters could be sealed into a 125-mile long river and lake system draining a watershed of 5,475 square miles. These waters could then be tapped by piercing the mountain wall at the western end of the reservoir formed by the system. A tunnel driven through this mountain wall would link the reservoir with a powerhouse constructed inside the mountain at its base. This plan has now been largely executed, according to the magazine.

The dam is the third highest rock-fill dam in the world. It has a crest length of 1,550 feet with sloping flanks rising 317 feet to a 40-foot wide strip at the crown. At the outset, to obtain fill for the dam, a quarry rock face was blasted by the biggest shot of dynamite ever used in Canada. In the explosion, 200 tons of dynamite scattered rocks weighing up to 20 tons.

In excavation for the powerhouse and tunnels, the magazine continues, more than 1,000 miners drilled, blasted and mucked 1,564,000 cubic yards or nearly 3.5 million tons of rock.

Ten-Mile Tunnel

The main tunnel is ten miles in length and 25 feet in diameter. It terminates 2,600 feet up the side of the mountain, after which it divides into two penstocks. The main tunnel was driven in four headings. At one point the miners set a world record when in six days they drove 282 feet of 25 foot bore in diorite granite on one heading, an average of 47 feet daily. Included in that total was a 24-hour record of 61 feet.

A total of 53,000 feet was driven for the main tunnel, the magazine says. Each foot of tunnel advance brought out 21 cubic yards of rock, solid measure.

At the point where the tunnel divides into the two penstocks the water begins a 2,600-foot descent, a drop more than 16 times the height of Niagara Falls. To contain the tremendous pressure developed by the water in its flowing descent—1,000 pounds per square inch at the bottom — these penstocks have to be lined with concrete backing up armor-plate steel.

Inside diameter of the penstocks is 11 feet but the penstock tunnels were excavated up to 15 feet. At the lower end, each penstock divides into four conduits, and all eight conduits feed into a valve chamber which houses a 51-inch spherical valve for each conduit. Also excavated out of rock, this valve chamber is 35 feet high, 20 feet wide and 465 feet long, the magazine reports.

Through the conduits, the water feeds into gigantic turbine-generator units. From each turbine-generator unit, the water will be discharged into a tailrace branch, the eight branches converging into one discharge tunnel 27 feet in diameter and 40 feet high.

Powerhouse Inside Mountain

The powerhouse itself is an enormous rock chamber some 1,400 feet inside the base of the mountain; the chamber is 80 feet wide, 120 feet high and 700 feet long. The largest multi-nozzle impulse turbines in the world have been installed. For the first stage of development three turbine-generator units are being used.

From the switch station at Kemano, the power is carried 48 miles to the smelter at Kitimat. The transmission line was strung through a series of valleys and up over Kildala Pass at 5,300 feet elevation.

For the first stage, two potlines have been built at the smelter, the magazine continues, each 100 feet long, housed in six buildings. The second stage will involve the addition of four more potlines at Kitimat and five more turbine-generator units in the powerhouse at Kemano. The third stage will involve additional tunneling and excavation — the boring of a second 10-mile tunnel and the extension of the powerhouse to add eight turbine-generator units, the expansion of the watershed and the addition of six more potlines.

On Training—
Letters from Leaders

In the last issue of Midwest Engineer we published another of about thirty letters received from leaders of Chicago-area firms concerning shortcomings noted in the engineers in their employ. Many of the letters also suggested what the engineers should do to correct their deficiencies.

Significantly, the engineer's technical training is generally considered adequate. In the broad area of Human Relations, however, engineers seem often to be "under achievers," according to the viewpoint of the industrial leaders as reflected in their letters.

We are printing another of these letters in this issue, as we shall do in future issues. Although the letters may be of greatest value to the younger engineers, we hope that all of the engineers who read them will benefit.

Here, then, is the next letter:

Dear Mr. Becker:

This is to acknowledge your letter of August 31 with respect to educational needs of members of the Western Society of Engineers.

We have given much thought to the question which you ask, and we feel that an educational program which would specialize in overall business problems would be exceedingly helpful to engineers. Any work which is done in a development laboratory has of course no value until it results in a new or much improved product. Obviously, a decision with respect to marketing of new or improved products requires careful analysis of all factors which may have a bearing on this step, the majority of which are not technical problems.

It has been my experience that engineers are often not sufficiently cognizant of business problems from the standpoint of marketing, financing and, even in some instances, manufacturing.

An engineer who is to advance into executive positions must have this business sense in order to successfully carry out this responsibility.

We sincerely hope that these few brief comments will be of help to you in your worthwhile problem.

Sincerely yours,

N.U. Establishes A New Department

A new graduate department in metallurgical engineering has been established at the Northwestern University technological institute, it has been announced by Donald H. Loughridge, the dean.

Metallurgy is the science of recovering metals from ore and developing them as useful industrial components.

The new department will go into operation with the beginning of the fall term this September and will offer master's and doctorate degrees in metallurgical engineering.

Loughridge also announced the first three faculty members to be appointed. They are Morris Fine, professor, presently with the Bell Telephone Laboratories, Murray Hill, N.J.; Jacob P. Frankel, associate professor, formerly the lead metallurgist with the California Research and Development company; and Donald H. Whitmore, assistant professor, a member of the institute's faculty since 1948.

The department now has two laboratories in physical metallurgy and metallography, one X-ray metallography laboratory, and one chemical metallurgy laboratory. Plans call for establishment of several additional laboratories and expansion of the departmental faculty to five members. A number of teaching and research assistantships also have been made available.

"The rising demand for new and better alloys makes necessary an increased emphasis on metallurgy in the nation's engineering schools," Loughridge said.

Loughridge said that America's first-grade ore deposits are rapidly dwindling and that economic methods of producing metals from lower-grade deposits are sorely needed.

It is only in the past 35 years that engineers have taken much interest in metallurgy as a science, Loughridge said, though it has existed for centuries as an art. He said military needs in particular have accentuated the demand for new alloys such as the titanium-base alloys, some of which are as light as aluminum but of strengths comparable to steel.

"There are only about 15 highly regarded graduate departments of metallurgy in the country, and most of these are in the East," Loughridge said. He added that establishment of the new department at Northwestern is a logical step because a very large proportion of the nation's metallurgical industries are located near the University.

Paving Machine Lays 1000 Feet a Day

Concrete paving without road forms has become a reality with the introduction of a self-propelled formless paving machine that can lay better than 1,000 linear feet of slab daily, Construction Methods and Equipment, McGraw-Hill publication, reports.

Used experimentally on an 18,000-foot stretch of road in southern Illinois, the machine required a crew of only 11 men, as against the 32 to 33 that would have been needed with ordinary paving methods, the magazine says.

The rig, adjustable to handle slabs 18 to 26 feet wide and of any normal thickness, travels on a pair of 13-foot crawlers. Forms 29 feet long extend ahead of the rig to confine concrete deposited on the subgrade by a dual-drum mixer. A surface vibrating screed (piece that levels off the concrete) extends across the machine; it consists of two 2x10 inch planks set on edge and carrying an electric vibrator in the center. Reciprocating transverse screeds are mounted four feet fore and aft of the vibratory screed.

As the rig advances, the magazine explains, the mix is struck off by the first reciprocating screed, consolidated by the vibratory screed and finished to final grade by the second reciprocating screed. The rig is powered by a 140-hp engine.

It is not difficult for the machine to maintain alignment. Maneuverability of the crawlers makes it easy for the operator to match a wire pointer on one form with a string line staked on the grade. However, the magazine notes, it is imperative to have a smooth stretch of subgrade finished to the proper elevation if the paver is to lay a slab of correct thickness and at the correct grade. On the experimental piece, the subgrade was prepared by motor graders, whose operators had to exercise extreme care to obtain minute accuracy.

WSE Personals

Major Lenox R. Lohr, MWSE, president of the Museum of Science and Industry in Chicago, is the new president of the Society of American Military Engineers. The installation ceremonies took place at the U. S. Naval Academy at Annapolis, Md.

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Otho V. Tally, MWSE, has been promoted to director of industrial sales for Allis-Chalmers. He will now be in charge of all industrial sales nationwide. Formerly he was regional director of sales. Tally's new position became effective on May 17. He has transferred to Milwaukee. H. M. York, formerly of the New England region in Boston succeeds Tally in his old position.

* * *

At its recent annual meeting the Board of Directors of the Joslyn Mfg. and Supply Co. accepted Ralph C. Boozer's request to be relieved of his responsibilities as secretary-treasurer, offices which he has held since 1927.

Boozer joined the Joslyn Mfg. and Supply Co. in 1911. He was elected assistant secretary Dec. 12, 1924. In January, 1927 he was elected to the office of secretary and also a member of the Board of Directors. On July 13, 1927 the Board of Directors appointed Mr. Boozer secretary-treasurer. Boozer continues as a member of the Board of Directors.

Following Boozer's request, the Joslyn Board of Directors elected the following officers:

George B. Sturtz, formerly assistant secretary was elected secretary, and D. Jack Hart, formerly assistant treasurer was elected treasurer, both for the ensuing year. The Board also elected Leon J. Streit as comptroller.

* * *

Frank Varenhorst, MWSE, formerly general coordinator with the Illinois Bell Telephone Company, has been transferred to inside wire chief at the Lake View office. His new duties are to direct the activities of the men who maintain the telephone equipment inside the Central office. This office cares for over 100,000 telephone stations. It is located half a block from the Chicago Cubs ball park. This office is a long-distance center. It also cares for information traffic. Further, it houses training headquarters for operation of various types of switchboards. It is a dial office and has not only some of the earliest cross-bar telephone switching equipment but also some of the most modern. About 10 million telephone calls a month are originated at this station.

Frank Varenhorst

* * *

The Directors of the American Society for Testing Materials have announced the establishment of the **Frank E. Richart** Award which has been made possible through the interest of his family. He was formerly a member of WSE.

An honorary member of the Society, a long-time worker and officer, and chairman of Committee C-9 on Concrete and Concrete Aggregates in which field he was an outstanding authority, Professor Richart was senior vice-president of ASTM when he became ill. He died in July, 1951, shortly after attending the Annual Meeting in Atlantic City.

The award will be given for outstanding technical investigations in the field covered by Committee C-9. The award, consisting of a suitably engrossed certificate and an honorarium, the amount of which will be decided by the Board of Directors, is to be given not oftener than every three years. The committee that will make the selection for the first award includes **Professor H. J. Gilkey,** MWSE, chairman, L. W. Teller and K. B. Woods.

Professor Richart devoted a great amount of energy and time to the work of ASTM both in its technical and administrative phases, and was held in high regard by his friends and associates.

Professionals' Roster Is Available for Use

The Annual Roster of Registered Professional Engineers has been received at the headquarters of the Western Society and is available for use by any member of the Society.

Obituaries

The Western Society of Engineers has recently been notified of the following deaths:

* * *

James S. Anderson, a member of the Western Society since 1935, died on February 19, 1954 at Evanston Hospital, Evanston, Illinois.

He graduated from Northwestern University in 1934. In 1944 he received his graduate degree in engineering from the same institution. Mr. Anderson belonged to the American Society of Civil Engineers besides the Western Society.

Mr. Anderson, at the time of his death was chief engineer and general superintendent of the Robert G. Regan Company in Joliet. He had served on the Wilmette, Illinois zoning board of appeals. He also had been a trustee of the First Presbyterian Church where he only recently had become an elder. In addition he had been a committee member for a local boy scout troop.

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William H. Terrey, a member of the Western Society since 1924, died February 22, 1954. Retired at the time of his death, he had been an electrical engineer with the Commonwealth Edison Company.

* * *

Claude Ernest Cox, a member of the Western Society since 1937, died on March 22, 1954. From 1938 to 1944 he had served as a member of the Education Committee. Since 1948 the home residence of Mr. Cox had been at Orlando, Florida. He had been a civil engineer with the Henry Bosch Company.

* * *

George B. Springer, a Life Member of the Western Society, and a member since 1890, died on November 30, 1953, the society has just learned.

Mr. Springer had received a degree in civil engineering at Ann Arbor, Michigan. For a number of years he had been employed by the Commonwealth Edison Company. He had been retired for some time at the time of his death.

Templin to Deliver H. W. Gillett Lecture

Richard L. Templin, assistant director of research and chief engineer of tests, Aluminum Company of America, will present on June 15 the third H. W. Gillett Memorial Lecture. Templin has selected the subject "Fatigue of Aluminum."

This lecture—first presented in 1952 at the Fiftieth Anniversary Meeting of the ASTM—is jointly sponsored by the American Society for Testing Materials and Battelle Memorial Institute. It commemorates Horace W. Gillett, one of America's leading technologists and metallurgists and the first director of Battelle. Each year it will cover subjects pertaining to the development, testing, evaluation, and application of metals.

The 1954 ASTM Annual Meeting will be held in Chicago during the period June 13 - 18.

Members of the Western Society have been invited to attend. Many of the advantages of this meeting are open to them upon payment of the registration fee.

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